Small Business Innovation Research/Small Business Tech Transfer

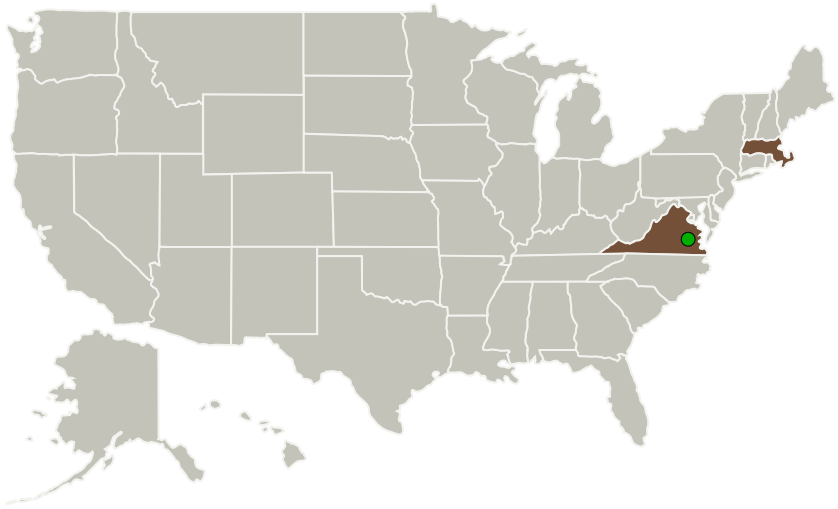
Differential Photoacoustic Particle Absorption Monitor, Phase II

Completed Technology Project (2014 - 2016)

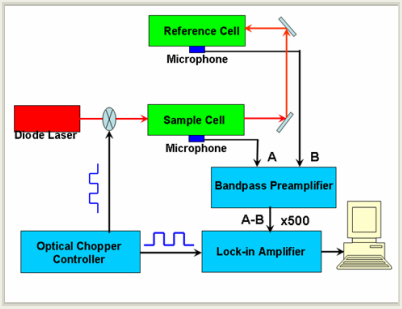
Project Introduction

We developed a highly sensitive and compact instrument to directly measure particulate matter (PM) optical absorption. This device is based on differential photoacoustic absorption spectroscopy (DPAS) technique, which is capable of eliminating background interference from gaseous NO2 and engine acoustic noise. This method significantly improves detection sensitivity compared to the single-cell photoacoustic technique. Over the currently used filter-based measurement techniques, it has the following technical advantages: 1) Direct PM absorption detection 2) Real-time measurement system 3) Low background noise 4) Low-cost commercial components

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Aerodyne Research, Inc	Lead Organization	Industry	Billerica, Massachusetts
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



Differential Photoacoustic Particle Absorption Monitor, Phase II

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Completed Technology Project (2014 - 2016)

Primary U.S. Work Locations	
Massachusetts	Virginia

Project Transitions

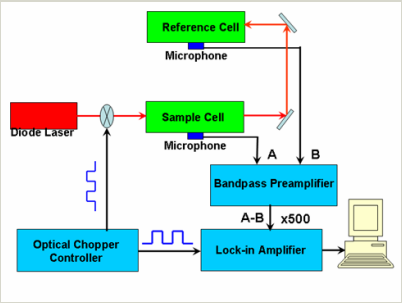
July 2014: Project Start

October 2016: Closed out

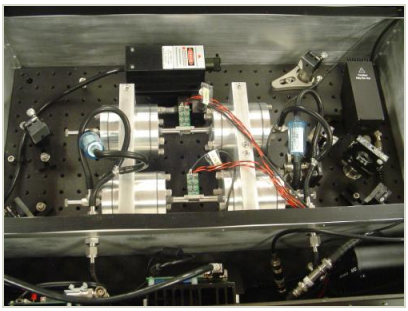
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137461)*

Images



Briefing Chart Image
Differential Photoacoustic Particle Absorption Monitor, Phase II
(https://techport.nasa.gov/image/130200)



Final Summary Chart Image
Differential Photoacoustic Particle Absorption Monitor, Phase II Project Image
(https://techport.nasa.gov/image/126431)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Aerodyne Research, Inc

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

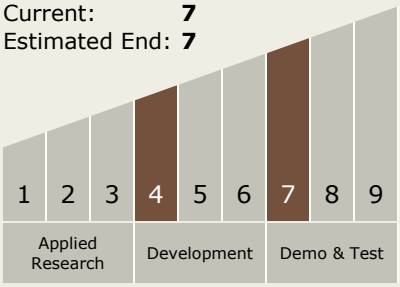
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Zhenhong Yu

Technology Maturity (TRL)

Start: **4**
Current: **7**
Estimated End: **7**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.1 Field and Particle Detectors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System